

LAYER-THICKNESS DETECTION METHODS AND
APPARATUS FOR WAFERS AND THE LIKE, AND
POLISHING APPARATUS COMPRISING SAME

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Abstract of the Disclosure

Methods and apparatus are disclosed for detecting a thickness of a surficial layer (e.g., metal or insulating layer) on a workpiece (e.g., semiconductor wafer) during a process for planarizing the layer, so as to stop the process when a suitable process endpoint is reached. Layer

10 thickness is detected based on a spectral-characteristic signal of reflected or transmitted signal light, obtained by directing a probe light onto the surface of the workpiece. Example spectral characteristics are local maxima and minima of signal-light waveform, differences or

15 quotients of the same, a dispersion of the signal-light waveform, a component of a Fourier transform of the signal waveform, a cross-correlation function of the signal waveform. Alternatively, the zeroth order of signal light is selected for measurement, or a spatial coherence length of the probe light is compared with the degree of fineness of the pattern on the surface illuminated with the probe light. An optical model

20 can be determined based on the comparison, and at least one of the layer thickness and the process endpoint is detected by comparing the measured signal-light intensity with the calculated theoretical signal light intensity.